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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/618,328	07/11/2003	Neal G. Skinner	2000-IP-000991 U1 USA	4751
20558	7590	04/05/2005	EXAMINER	
KONNEKER & SMITH P. C. 660 NORTH CENTRAL EXPRESSWAY SUITE 230 PLANO, TX 75074			FITZGERALD, JOHN P	
			ART UNIT	PAPER NUMBER
			2856	

DATE MAILED: 04/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/618,328

Applicant(s)

SKINNER ET AL.

Examiner

John P. Fitzgerald

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-38,40-54,86-94 and 100-105 is/are pending in the application.
- 4a) Of the above claim(s) 93 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-38,40 and 43-54 is/are allowed.
- 6) ☒ Claim(s) 41,86-92,94 and 100-105 is/are rejected.
- 7) ☒ Claim(s) 42 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Election/Restrictions

1. Claims 1, 13, 38 and 43 are generic and allowable. Accordingly, the restriction requirement as to the encompassed species is hereby withdrawn and claims 6 and 14-26, directed to the species of Figures 4 & 5 and 6 are no longer withdrawn from consideration since all of the claims to this species depend from or otherwise include each of the limitations of an allowed generic claim. However, claim 93, directed to the species of Figures 4 & 5 remain withdrawn from consideration since the claim depends upon rejected independent claim 86.

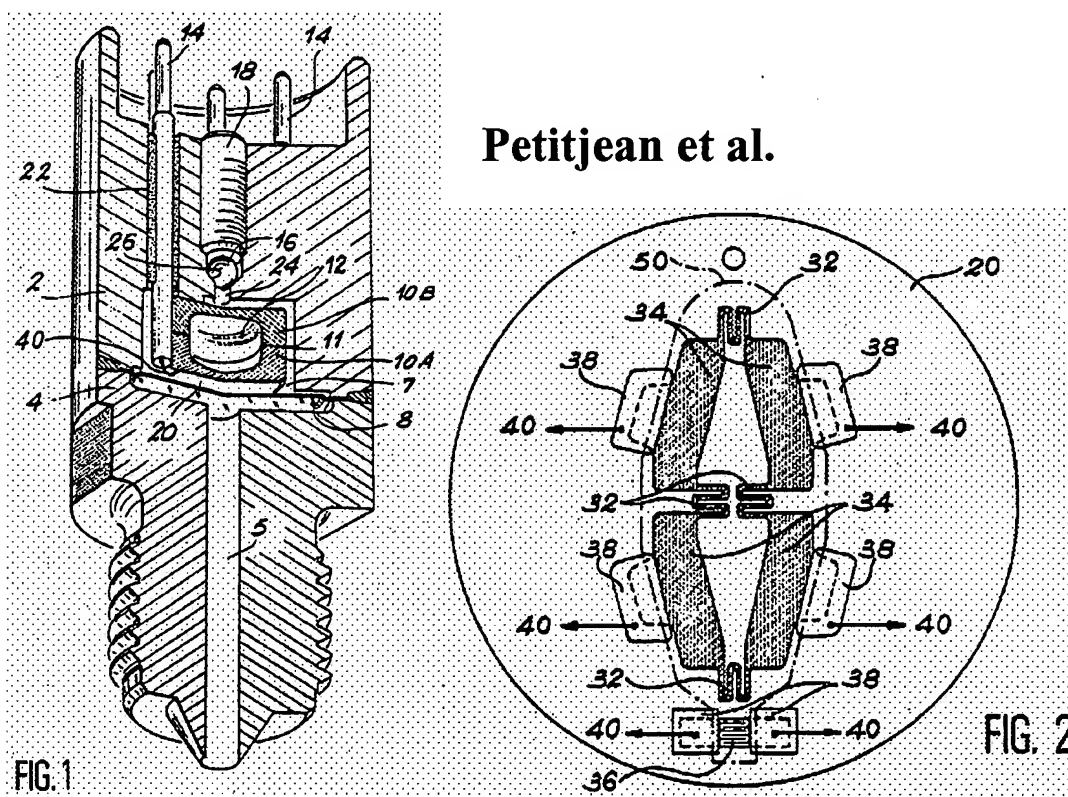
In view of the above noted withdrawal of the restriction requirement as to the linked species, applicant(s) are advised that if any claim(s) depending from or including all the limitations of the allowable generic linking claim(s) be presented in a continuation or divisional application, such claims may be subject to provisional statutory and/or nonstatutory double patenting rejections over the claims of the instant application. Once a restriction requirement is withdrawn, the provisions of 35 U.S.C. 121 are no longer applicable. See *In re Ziegler*, 44 F.2d 1211, 1215, 170 USPQ 129, 131-32 (CCPA 1971). See also MPEP § 804.01.

Claim Rejections - 35 USC § 102

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
3. Claim 41 is rejected under 35 U.S.C. § 102(b) as being anticipated by US 5,024,098 to Petitjean et al. Petitjean et al. disclose a subterranean well sensor system (Figs. 1-3) having a generally tubular structure (10a, 10b) (Fig. 3) having a pressure differential applied across its

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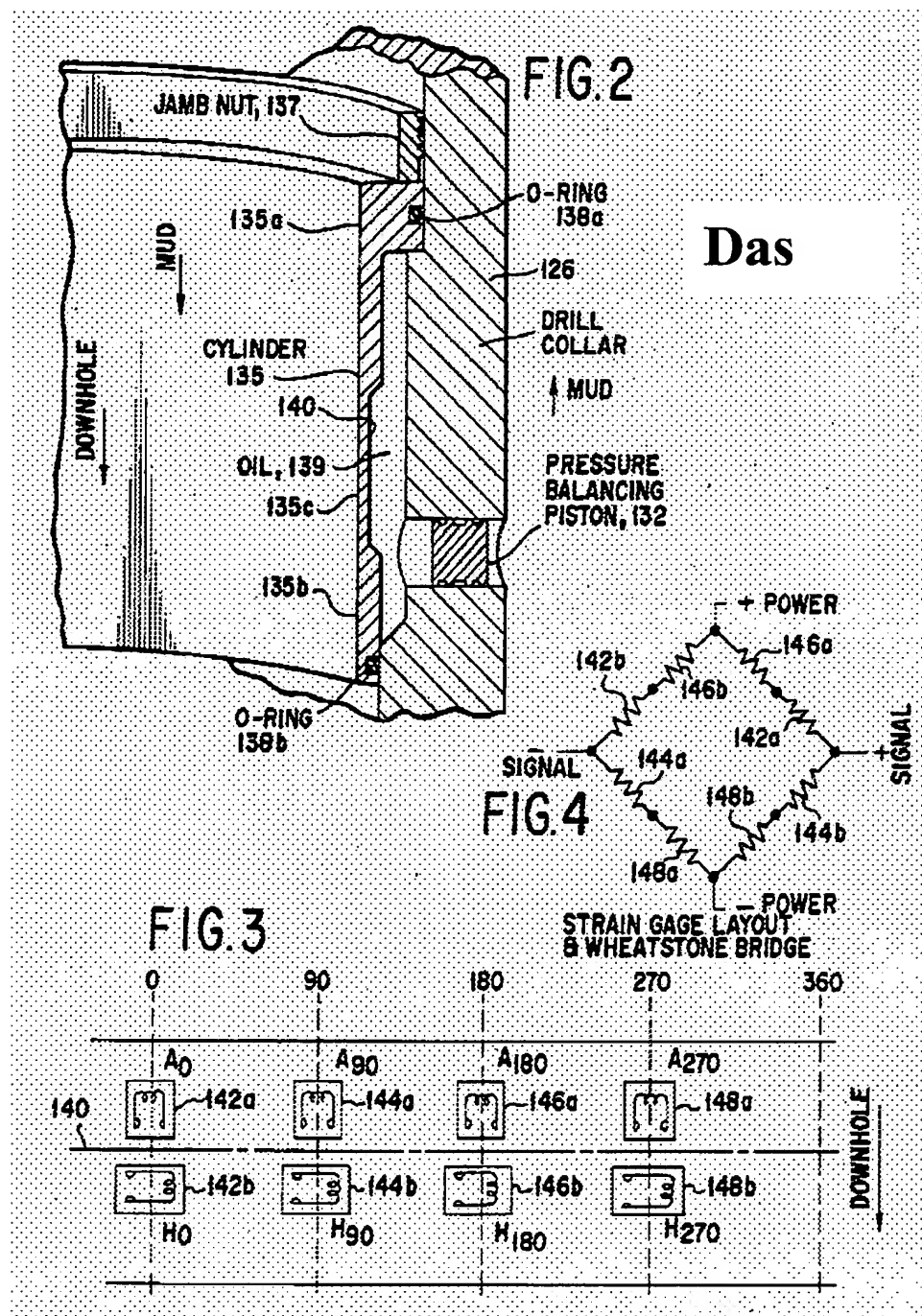
inner and outer surfaces, the pressure differential existing between well pressure applied to one of the inner and outer surfaces and a second predetermined pressure (0.1 Pa within an annular space (12)) between the structure and an outer housing (as recited in claim 41); first and second strain sensors (32) detecting strain induced by the pressure differential and temperature change in the well, the first and second strain sensors measuring strain in the structure in first and second directions different from one another (note orientation of the four strain sensors (32) in Fig. 2).



4. Claims 86-92 are rejected under 35 U.S.C. § 102(b) as being anticipated by US 4,805,449 to Das. Das discloses a method of measuring pressure in a subterranean well (Figs. 1-3) the method steps including: applying a pressure differential and a temperature change across a structure positioned in the well (see Fig. 2 below); detecting a first strain in the structure in a first direction using a first strain sensor (142a); detecting a second strain different from the first strain

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in the structure in a second direction using a second strain sensor (148b) due to the pressure differential and temperature changes across the structure (note orientation of strain gauges in Fig. 3); calculating the pressure differential using a predetermined mathematical relationship between the pressure differential and the first and second strains (see Table at top of col. 7) wherein the calculating the pressure differential can be performed *without* (emphasis added) connecting the first and second strain sensors in a wheatstone bridge, but used as direct inputs (Das: col. 9, lines 17-20); wherein the strains due to temperature changes are subtracted (compensated) from the strains measured due to the pressure differential via a Wheatstone bridge (Das: col. 7, lines 23-28) (as recited in claim 89); wherein first and second directions are orthogonal to one another (i.e. axial and hoop directions) (see Fig. 3) (as recited in claims 90 and 92); wherein the structure includes a generally tubular portion (135) and the pressure differential is applied between the inner and outer surfaces of the tubular portions (see Fig. 2 below).



5. Claims 100-105 are rejected under 35 U.S.C. § 102(b) as being anticipated by US 4,805,449 to Das. Das discloses a method of measuring pressure in a subterranean well (Figs. 1-3) the method steps including: applying a pressure differential and a temperature change across a

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structure having a generally tubular portion, positioned in the well (see Fig. 2 above) detecting a first strain and a second strain in the structure induced by the pressure differential and temperature change via first (142a) and second (148b) strain sensors and a predetermined mathematical relationship existing between the pressure differential and the first and second strains; wherein calculating the pressure differential and temperature change using indications no more than the first and second strain sensors but used as direct inputs (Das: col. 9, lines 17-20) (see Table at top of col. 7) (as recited in claims 100-103); wherein the first and second strain sensors are centered at approximately a same longitudinal position on the tubular portion, and the first and second sensors are radially offset with respect to each other by approximately 180° (see Fig. 3 above) (as recited in claim 104); wherein the first and second strain detecting steps sense hoop and axial strain, respectively in the tubular portion of the structure (as recited in claim 105) (note: orientation of strain gauges in Fig. 3 above).

Claim Rejections - 35 USC § 103

6. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

7. Claim 94 is rejected under 35 U.S.C. § 103(a) as being unpatentable over US 4,805,449 to Das as applied to claim 86 above, and further in view of XP-002053711 to Kersey. Das discloses a subterranean well sensor system and method of measuring pressure in a subterranean well having all of the elements stated previously. Das fails to disclose the use of fiber optic sensors and their many variants as recited in the dependent claims. Kersey teaches the employment of fiber optic sensors for measuring temperature and strain (thus stress/pressure) in

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subterranean wells utilizing Bragg gratings, Mach-Zehnder interferometer, Fabry-Perot interferometer and others. It would have been obvious to one having ordinary skill in the art at the time the invention was made to employ any type of fiber optic sensor, as taught by Kersey, modifying subterranean systems disclosed by Das and Petitjean et al., thus providing high-sensitivity strain measurements (Kersey: pages 310-314). Furthermore, it would have been an obvious matter of design choice to employ any one of the fiber optic sensors recited in the claims, since applicant has not disclosed that any particular type of fiber optic sensor solves any stated problem or is for any particular purpose and it appears that the invention would perform equally well with any type of fiber optic sensor.

Response to Arguments

8. In response to applicant's argument that the references fail to show certain features of applicant's invention, namely the "second predetermined pressure" recited in the last lines of claim 41, is noted, however incorrect. Clearly, in a steady state flow condition, the subterranean well sensor system disclosed by Das clearly function identically to the instant claimed invention, and not "vary" as the Applicant has pointed out, thus clearly meeting the limitations of the claim.
9. Applicant's arguments with respect to claims 86 and 100 have been considered but are moot in view of the new ground(s) of rejection, namely, Das clearly discloses that inputs can be used directly from the strain sensors to indicate the pressure/temperature changes.

Conclusion

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10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to John Fitzgerald whose telephone number is (571) 272-2843. The examiner can normally be reached on Monday-Friday from 7:00 AM to 3:30 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron Williams, can be reached on (571) 272-2208. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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JF

03/25/2005



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